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Dynamic Partnership in Online Logistics Community

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Abstract

Agents of various capabilities in the logistics community individually or together collaboratively serve very different shipment requests offline. With the challenges of global e-business, the capabilities of collaborative partnering and planning online increase agents' competitiveness and enhance logistics process performance. In this paper, we define *dynamic partnership* – a conceptual underpinning to maximize the four e-rights for the online logistics community. Three core factors, namely *credibility*, *reliability* and *viability* are introduced to guide successful partnership online. A survey of logistics service providers in Hong Kong confirms the relevancy of the four e-rights and three core factors in collaboration efforts. A conceptual analysis with respect to partnership flexibility, collaboration and performance of dynamic partnership is given. To realize such partnership in the logistics community, the electronic platform requirements are identified.

Introduction

Today, the logistics industry, buoyed by the growth of global business, is continuously challenged with shipment requests that now cover destinations worldwide. With e-Business pushes the developments of JIT practices in, and the integration of supply chains, shippers require on-demand, time definite and highly customized logistics services [1][2]. Effective collaboration among forwarders and their agents is imperative to provide quality services with guaranteed delivery [3]. The logistics industry in the integrative era [4] must be led by innovative logistics services where shipment planning is knowledge-driven and global agents dynamically join and intellectually work together effectively.

Logistics service providers are well aware that it is hard to meet the challenges of many diversified shipment requests from global shippers based on their own schedules and preferences. Single forwarders, even with a few closely cooperating partners, soon discover their capability and flexibility are limited and cannot easily adjust to fit the emerging shipment needs. With no new customers, and general decrease in shipment sizes, it is hard for service providers to stay profitable or even just to survive. They must become more agile, e.g., quick partnering with fitting agents to handle new routes, and flexible, e.g., be able to allow malleability in their own activities to satisfy highly customized requirements.

We have seen express couriers entered into the industry that provides personalized, accurate and transparent logistics services as a single party [5]. These integrators can fully gather and control often disjoint multi-agents' activities and own, if not all, most of physical facilities. The centralized management of all the shipment activities with an information system enables these integrators to provide up-to-the-minutes shipment information to their clients via the Internet. Shippers are willing to pay a premium for the integrators' services as the competitive gain outweighs the costs. For traditional forwarders, they can definitely deliver the shipment to the destination, but with comparatively sub-par and non-committal logistics service quality. Lack of tight coordination among partnering agents, and with individual information systems that generally are not interoperable further complicated the challenge to stay and regain the competitive edge.

Logistics service providers must heed the transformation to survive in the integrative era such as change from offline adversarial and loosely coordinated, to online viable partners and tight collaborative relationship. Such virtual integration is possible in a logistics community [6] online where agents go beyond procedural interactions to collaborate with best partners at the time with added benefits of integration and consolidation, as well as an expanded market [7][8]. Leung et al. has suggested such a community network, and the values of such a community are convincing and obtainable [9]. Unfortunately, the take-up by practitioners, mostly small and medium enterprises (SMEs), is hindered by the lack of capabilities (capital, technology and knowledge) to join the community network and to work continually online. We believe the shift to online logistics is inexorable. The logistics industry must be ready to embrace the 'community network,' now as an electronic platform, or e-Platform, which provides vast opportunities and facilitations to the practitioners. To work in an online community, logistics service providers must improve their current practice, and/or be creative and innovative in handling new shipment demands.

Traditionally, a logistics process must get the right product to the right place at the right time [10]. The 'right' guarantee is practiced by coordination among

the participating parties before the execution of the logistics processes, ensuring minimal aberration. While online, the coordinating parties could be opportunistically partnered to service a specific shipment on-demand. The partnership faces with many new unknowns in the virtual environment. It is imperative for partners collectively to make the decision (*right decision*) to form a group (*right group*) promising values (*right value*) to partners individually with high degree of service completion (*right integration*):

1) Right decision: agents online are exposed to far more shipment opportunities and able partners. Concurrently, there are inherent uncertainties and unknowns hinder their service efficiency and responsiveness. Proper decision on planning and assignment for all requests must be made both timely and in prudence.

2) Right group: right composition of agents is needed to meet a shipment requirement. The 'composing' becomes a challenging task online with numerous viable combinations and each with a number of 'fitting' partner choices; these choices though could be of mainly unacquainted agents.

3) Right value: for a successful partnership, it is crucial to ensure individual's valuation of the return on services is both satisfactory and achievable as a whole. Thus, a balance of benefits allocation, which is acceptable by each partner, must be established.

4) Right integration: the appropriate level of integration must be established to ensure the correctness and responsiveness of the shipment process as customers can and will switch easily online. It also prevents the problems of "over-integrated" which reduces each agent's exclusive capability.

To successfully establish the four rights for any ad-hoc partnership formed on-demand online, we believe some form of partnership must be articulated as such the *rights,* or *e-rights,* can be ensured for online logistics. However, to the best of our knowledge, there is no theoretical foundation on such partnership concept. Past studies on logistics industry were mainly empirical-descriptive in nature and without theoretical support. There is no generic insight on the dynamic behavior of inter-organizational relationships and networks [11]. Thus, the challenges can be viewed from three different dimensions. The most important one, in our opinion, is the lack of a conceptualization of the 'online partnership' – what it is, what determines it and how it manifests and lives online. The second dimension is the design of such virtual environment for the partnerships. The third dimension is the integrative technology to enable such partnership formation and sustain its life cycle for a shipment.

In this paper, we address the first dimension by describing the dynamic partnership conceptualization followed with an analysis. We begin in the next section by reviewing the current concepts on partnership and collaboration in logistics community, which we identify the opportunities and challenges. Then, we propose the dynamic partnership concepts and analysis. An empirical study is provided to establish the validity of dynamic partnership concept. Next, we discuss the practicality of dynamic partnership realization, which leads to the second and third dimensions. Lastly, we conclude this study and suggest future research directions.

2. Partnership and Online Collaboration in Logistics Community

In an online logistics community, shippers are more willingly to post shipment requests as there are more competitive responses as partnerships can be formed dynamically and viable. In such online business ambient, the partnership thus formed to service a shipment request collaboratively by partners must be explored. We begin by looking next at offline traditional partnerships which are evolved from the collaboration relationship among logistics players, with common practice standards and agreed collaboration mechanism [12][13].

2.1 Partnership

In the logistics industry, partnership is mainly formed between forwarders and agents, with fixed parties and long-term commitment. Alliances or subcontracting partnerships are common as these individual parties still own, plan and control their resources. It is becoming apparent to an increasing number of participants that new partners with more diverse capabilities are needed to cater the fast-changing shippers' requirements, and yet how these partners can be quickly found and viable partnership achieved. Traditionally, the establishment of a partnership generally involves three tasks: selecting partners, establishing relationship and developing agreement [14][15]. Such partnering process has been described for prescribed partnership type such as alliances. To cater the fast changing needs, partnership must be improved, and some partners may need to be replaced. Partnerships should not only form for long-term strategic developments and benefits, but also for operational fulfillments and short-term profits. To the best of our knowledge, there is no past research suggesting a holistic partnership framework for temporary-based partnering, and in an electronic environment.

2.2 Collaboration

The collaboration in logistics community refers to the working together among agents (e.g., truckers, carriers, and other logistics service providers). A

forwarder's master plan drives and coordinates all agents' tasks in order to complete the shipment with little or no interaction among agents, and minimal tolerance for slight alternation in activities. With web technologies development, some agents began to use IT to facilitate their logistics activity integration, which is called online collaboration [16][17]. Yet, the benefits to conduct online collaboration remain unclear to most. Chen et al. [18] suggests an e-Collaboration paradigm to allow the description of collaboration in terms of levels of integration. The complexity of collaboration is now manageable gauged by integration level among partners. As partnerships are formed online, how such partners collaborate would be defined.

2.3 Online Community: Opportunities and Challenges

e-Business has become the new online paradigm and a way to sustain the competitive advantage through business collaborations and automation [19][20]. For the logistics industry, it is imperative for agents to conduct integrative activities online to meet the challenges across the globe. The logistics process, no doubt, is becoming more complex involving extensive communication and hand-over between parties. The goal is to be able to provide responsive and flexible service, and to ensure reliable delivery with tight integration with sufficient capabilities and improved service quality.

With the continuous developments of e-logistics, agents discover new opportunities online. Participants of online logistics community must ensure the four rights (e-rights) for logistics process are attained. Forwarders should quickly join with global agents to fulfill various shipments' requirements. That is, some kind of close partnership must be formed instantly with respect to shipment demands by increasing the collective capabilities ensuring the service quality and removes any capability restriction. However, such approach is difficult to attain, especially in an online environment.

In a partnership, collaboration among partners is a must and crucial. Quite often, partnership and collaboration are treated separately and non-consequential: when the partnership is formed, partners normally retain the collaboration relationship they had adopted for a long time requiring low levels of integration such as communication and/or contribution. They are unaware that different partnership relationship and integration levels are needed for different problems or customers' needs. So, how such partnership can be reached with immediate collaboration online?

3. Dynamic Partnership Conceptualization

A partnership must be formed in a timely manner to be competitive for any shipment request posted. Such partnership must have the characteristics of reaching certain degrees of the four e-rights, ensuring the competitiveness will be crystallized for continuous alliance or posited as a viable partner in other future partnering. In principle, the best-fit partners will join as a group, and the best is dependent on the plan under consideration. The dynamicity of best-fit is complex if without definable anchors or guiding factors. The partnering process must be transpired online and traditional offline partnership establishment, which may takes few weeks or even few months, is not applicable. The concept of dynamic partnership is introduced next allowing a one-step partnership collaborating online to complete a shipment request with intended performance and returns.

3.1 Dynamic Partnership Definition

Dynamic partnership means an agreement is reached by the exact opportunistic participants as a group after free explorations concluding such partnering is of maximized return individually and competitiveness collectively within an opportunity window. Dynamic means continuous and productive activity or change. Dynamic partnership thus formed can be a short-term online collaboration for a single or several shipments.

Partnership in logistics is likely to be formed of participants with non-overlapping heterogeneous capabilities; seamless integration of logistics processes of the partners should be 'understood' and 'considered to be achievable' within a short time to bid for the shipment requirements. Such partnership formation on the surface could be similar to the process of forming a team to play in an online game that involved multiple parties. An online game can begin once the exact number of players is satisfied; the role of each player may not be important to the others; leaving the game in the midst is optional and an unfinished game can continue later or is never of any consequences to the players. Dynamic partnership involves participants playing same or different and unique role, and each must equip with sufficient knowledge and capability in performing the exact logistics service that the participant is good at. The shipment service must be complete as requested, and the failure of any one party is negatively consequential to all involved and could be detrimental to individual competitiveness. Thus, each agent identity must be certified and unique, with ensured service level. Besides, online game collaboration is score-oriented and gain-even, but dynamic partnership is a shipment-oriented and local-maxima practice. The failure of any one of the shipment activities can affect all partners' return and

reputations [21]. For online game, participants' benefits mainly come from the enjoyments of participation and victory, given a fixed game environment and rules. Conversely, dynamic partnership has to be formed per shipment, generally in a complex, uncertain environment with broad scope and urgent requests. Each partner's benefits are highly affected by all partners' negotiation and performance. So, how do we guarantee such dynamic partnership is a best practice with high success rate?

3.2 Three Core Factors

To ensure a high success rate, all partnerships must inherent some basic traits such that the four *e-rights* are guaranteed. For pre-formed alliances, they can attain these with validated account credits, by adjusting departure and delivery times and following the long-term signed benefits allocation contract. Yet, a reliable party to lead the cooperation and constructing a fair allocation mechanism for the benefits are the impediments [22].

Dynamic partners, who conduct integrative logistics activities together with unacquainted agents, cannot follow the aforementioned way to overcome these difficulties. Three core factors: *credibility*, *reliability* and *viability*, are thus identified to value the partnership in meeting a shipment requirement. Although these factors can be found from studies on the partnerships or collaboration [23][24][25][26], they were discussed in the long-term and fixed partnership or in low level integration contexts. Here, we provide new definitions with respect to the shipment driven, highly integrated dynamic partnership.

Credibility: the evidence showing an agent is accountable of performing the activity one is interested in. It may include agent's performance quality, reputation, expertise and competence and financial stability. As a whole, the evidence should prove that the agent is capable on performing the chosen activity. These are the measures of identifying the trustworthy partner.

Reliability: the dependability that logistics players can perform the tasks as promised. Agents are required to clearly specify all the responsibilities of the roles. Back-up or contingency plan should be considered, so that partners have the flexibility to handle the shipments in case of unexpected situations. These are the measures for ensuring the robustness of activity execution.

Viability: the practicability that each partner finds forming partners can expand one's value: in terms of reputation, resource utilization or ROI. Every partner has the incentive in joining the partnership and collaborating accordingly. These are the measures for enabling successful collaboration.

Each factor is equally important in ensuring a feasible dynamic partnership. With Credibility, Reliability and Viability (CRV), participants can be ensured that the composition of the partnership fitting the shipment requirements, all the activity execution will be robust under uncertainties and there is a fair and grounded system to resolve conflicts.

3.3 Logistics Partnerships Survey

To investigate if the logistics industry has similar needs and requirements as we proposed, we conduct a survey to examine the current partnership characteristics. In particular, it is used to verify the importance and validity of the following statements:

Statement 1. the right decision, right group, right value and right integration are the most important factors in successfully completing logistics activities with partners.

Statement 2. creditability, reliability and viability are the three core factors in forming partnership.

Methodology

The targeted interviewees are logistics industry practitioners. We conduct the survey using two methods, sending emails to freight forwarders and distributing questionnaire during a public forum on a current topic of relevancy to the logistics industry.

Results

We have successfully collected 59 questionnaires, and among them 45 are valid. The sample covers various logistics practitioners in Hong Kong, including freight forwarders, warehouses, air carriers and terminal operations for the air, land or sea logistics. Currently, there are about 150 companies actively participate in different modes of goods carriage in Hong Kong (Figures are based on Hong Kong Logistics Association and Digital Trade and Transportation Network member lists). Therefore, the respondents represent about 30% of the populations, which makes the survey results representative. The detailed results of each question are as follows.

The first question is used to identify the logistics practitioner's role in the industry. As shown in Table 1, all practitioners are working on more than one logistics functions. This may increase their complexities in coordinating internally and externally.

Table 1. Logistics Functions Provided by Interviewees

Logistics Function	% of Interviewees
Air Transportation	71.1
Warehousing	60.0
Road Transportation	44.4
Sea Transportation	57.8
Freight Forwarding	55.6

Question 2 shows that most of them are working with multiple and different types of partners (Table 2). That means that most of the logistics services often are provided together as one by more than one company. Collaboration is required among companies.

Table 2. Types of Logistics Partners for daily logistics operations

Types of Logistics Partners	% of Interviewees
Transportation companies	73.3
Airlines	62.2
Warehouses	62.2
Sea liners	55.6
Terminal Operators	62.2
Local Forwarders	64.4
Oversea Forwarders	57.8
None	6.7

Question 3 is for identifying their current collaboration levels. Their major activities include communication, planning shipment together, sub-contracting or outsourcing. Less than 25% practitioners will trade resources or shipments with partners (Table 3). This result reflects that partners are still only working together at a relative low level, i.e. communication. Not many of them consider collaborate on trading, which directly affect their costs, profits and reputation.

Table 3. Activities working together with partners

Activity types with partners	% of Interviewees
Communication	87.8
Sub-contracting or outsourcing	56.1
Coordinating schedules	43.9
Planning shipment together	58.5
Trading resources	22.0
Trading shipments	24.4

The survey result (question 4) supports the proposed four e-rights as they are the most important rights to complete logistics activities with partners (Table 4). While capabilities and controlling authority, in comparison, are the least important concerns.

Table 4. Factors for successfully completing logistics activities with partners

Wording of Survey Question	Mean Response*
(i) I and my partners do not overlap our capabilities	5.15
(ii) I am capable of making flexible and timely decisions	5.78
(iii) My partners are best-fitted	5.43
(iv) I am satisfied with profit sharing	5.46
(v) We can solve different kinds of problems timely and effectively	6.03
(vi) We work well together	6.05
(vii) I have the controlling authority	4.93

* **Scale: 1, Strongly disagree; 7, Strongly agree**

For meeting new shipment requests, 84.1% respondents are willing to collaborate with new partners, mainly for the suggested 3 reasons: Good-will, reputation (59.0%); Get into new business (53.9%) and Increase profit (30.8%). While for those not willing to collaborate, the only two reasons are: Unfamiliar with new partners' practice and Difficult to determine the right partnering. Their concerns can be removed if CRV is adopted during the partner selection.

For finding partners, the factors we proposed are generally important (Table 5). It is interesting to find that communication, information security and resource utilization are also very important factors, too. Thus, in the following section, Realization of Dynamic Partnership, we have to ensure the easy communication and high information security are guaranteed in the design. While for resource utilization, further study is needed as this result contrasts with the major current activities working with partners – only about 20% practitioners are working with partners on trading resources and shipments.

Table 5. Factors for forming partnership

Wording of Survey Question	Mean Response*
(i) You have full trust on your partners' capability	6.27
(ii) Your partner fully understands his liability	6.13
(iii) Your partner always performs well	6.16
(iv) Your partner has financial stability	6.40
(v) Every partner understands his/her role and responsibility	6.11
(vi) Your partner can handle unexpected situations	6.07
(vii) Your partner always work strictly following the agreement	6.09
(viii) You partner's practice matches your own company's practice	5.60
(ix) You can communicate with your partner easily	6.22
(x) You and your partners' information can be securely transferred	6.02
(xi) You can easily establish satisfactory profit sharing agreement with your partners	5.73
(xii) You can increase resources utilization	5.82
(xiii) Collaboration can be easily attained	5.87
(xiv) The fulfillment is feasible and obtainable	6.02

* **Scale: 1, Strongly disagree; 7, Strongly agree**

In short, Statement 1 is valid while Statement 2 can be improved by assuming communication and information security are ensured.

4. Dynamic Partnership: An In-depth Analysis

The concept of dynamic partnership entails common discrete partnerships that are found in some partnership spectrum, and the agreement development can be clearly defined with respect to the degrees of CRV of the partnership. Collaboration among partners with different affinities can be described using the level of integration as proposed in e-Collaboration. CRV again provides the backbone where such collaboration can be clearly articulated. Lastly, with equal importance, the outcome/effect of established

CRV of a partnership can be assessed with respect to the corporate performance.

4.1 Partnership Agreement: Partnership Spectrum

Partnership types have been proposed and viewed in a spectrum [27][28]. After analyzing and summarizing the studies, these partnership types can be characterized using five factors: duration or commitment, equity ownership, sharing or disclosure of information, decision alignment and governance: monitor, control to adjust (Appendix Table 1) [29][30][31]. In general, existing partnerships belong to either one of the two following sides: flexible partnership with limited integration, such as outsourcing; or fixed partnership which is highly integrated, such as joint-venture. Conversely, dynamic partners have the flexibility from short-term commitment and no equity ownership, and on the other hand attain the benefits of highly integrated – closely working together with a shared goal. In short, dynamic partnership encapsulates all the discrete pairings with flexibility to partner anywhere with respect to the spectrum. The freedom is guided by the factors that a new partnership with different characteristics is well-defined.

4.2 Partner Affinity

Based on their needs, participants can freely form any of the types of partnerships. The selection of partners and the eventual relation can be governed by partner affinity which describes the composition and relationship among the partners (Table 6). In the simple case, a singular partnership implies the affinity is null as the preference of working together with others does not override the choice of providing all the services needed for accomplishing a particular shipment on his/her own.

With partners, the selection can be defined by a preceding negotiation process that a group of logistics service providers, likely with long-term commitment, has been formed. The composition of such pre-formed partnership could be based on the combined capability perceived to be conducive to each participant's intended goal and market expansion strategy. The affinity is considered as incidental matching. The partnership is a 'pre-scoped' dynamic partnership where the CRV is acceptable as it is, thus services provided will be restricted to a certain pool of shipment requests.

Dynamic partnership is a group freely entered into by any available agents on the community (Ψ) for a shipment request. The inclusion of unaligned agents (Ω) enables agents to form partner with any agent available on the community (Ψ). It is very likely that the number of partners can be considered is far more than the limited number in the aligned agents set (Π_A) with a selection of best partner combination from Ω. In this approach, the agreement "$\cup_d$" has to be the best-fit agreement, which ensures the group has enough capacity to finish all the shipment(s)' requirements. This can be attained with clear specification on the duration of the group, as well as each agent's responsibilities and benefits. That means, $\cup_d$ will be established if every partner's CRV requirements are fulfilled – credibility identifies the qualified set of parent or children; reliability measures agent's responsibilities; and viability ensures each agent's rights.

Table 6. Partner affinity

	Singular provider	Pre-formed partners	Dynamic Partners
Partner affinity	A	$A^* \cup_p \Pi_A$	$A \cup_p \Pi_A \cup_d \Omega$ = $A \cup_d \Psi$

A = a logistics service agent

$\Pi_A = \{B_1,..., B_M\}$: a set of aligned agents with service agent A

$\Omega = \{C_1,..., C_N\}$: a set of unaligned agents available on the platform

$\Psi = \{X_1,..., X_N\}$: a universal set of all agents available on the platform

With the partner affinity, every partner can clearly identify the partnership composition, relationship and capabilities, which helps them to improve. For example, integrator can be represented as singular provider *A*, which no agreement is required. A forwarder and agents group can be represented $A^* \cup_p \Pi_A$ where A^* represents the forwarder who dominates the partnership. For pre-formed partners, their capability is defined by their mutual agreement $\cup_p$ which generally belongs to one of the partnership types (Table 6). To increase capability, they have to re-negotiate $\cup_p$, which is limited by the lowest CRV values of fixed Π_A. Dynamic partnership removes such rigidity, as forwarder can always select the agents from Ψ who have the highest CRV values.

4.3 Partner Collaboration

Collaboration is consequential to any type of dynamic partnership as discussed. Effective collaboration is crucial. The three core factors of dynamic partnership can be used to gauge the level of integration required for collaboration. CRV also define the partnership types. In terms of partnership, more emphasis will be put on credibility and viability, the incentives of forming partnership. In terms of collaboration, more emphasis will be put on credibility and reliability, which ensure the operation quality (Table 7).

The concept of dynamic partnership allows a view of the partnership spectrum with implied level of integrations (See Figure 1) based on the evaluation of the CRV factors. For example, partners in alliance can easily adopt any levels from

communication to coordination. However, if the partners need to conduct cooperation or collaboration, these partners should increase their three core factors requirements to either joint-venture or value-chain. It is expected that the joined benefit will be increased as the level of integration increases. Conversely, the complexities of information and knowledge increase too. Agents must cautiously plan if the final benefit worth the efforts of forming such partnership and collaboration.

Table 7. Core factors requirements for partnership and collaboration

	C	R	V
General Member	L	L	N/A
Subcontract	M	L	L
Alliance	M	L	M
Coalition	M	M	L
Joint Venture	H	M	M
Value-chain	H	H	H

	C	R	V
Communication	L	L	N/A
Contribution	M	M	L
Coordination	M	M	L
Cooperation	M	H	M
Collaboration	H	H	M

C: Credibility, R: Reliability, V: Viability
L : Low, M: Medium, H: High

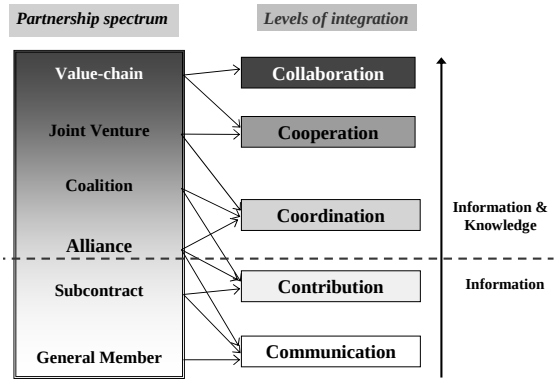

Figure 1. Partnership spectrum and levels of integration

4.4 Partnership Performance

From the managerial perspective, what are the roles of CRV in driving towards some performance targets? In general, business performance can be measured by three dimensions: financial, strategic, and operating, which gauge how well a company meets its targets [32][33]. The dynamic partnership concept allows the combination of any two factors to represent one dimension of the business performance (Figure 2).

1. When credibility and reliability are assured, partners have confident that can effectively control the tasks they work on together. The operational performance is guaranteed.
2. When credibility and viability are assured, each partner has the confidence and incentive to accomplish the partner's role. There is no economics aberration among partners. They have positive valuation on the financial performance.
3. When reliability and viability are assured, the relationship among partners will be clear. With reliable performance and secured revenue, these partners' reputation and goodwill will be guaranteed. This enhances and promotes them to maintain their integrativeness and sustainability. As a result, the strategic performance is ensured.

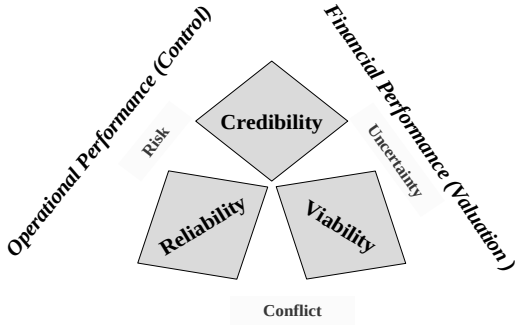

Figure 2. Three Business Performance Dimensions

Although different partner may have different performance benchmarks, all three factors must fulfill each partner's requirements. The underperformance of any one of the requirements will lead to the following undesirable outcomes, affecting no doubt the partner's short-term and long-term returns. With low operational performance, the partners are facing high risk, as their processes' outcomes become probabilistic. With low financial performance, it results in high financial uncertainty, which leads to critical profitability factors unclear and unquantifiable. With low strategic performance, there will be conflicts arise - friction or opposition resulting from differences or incompatibilities.

In sum, the concept of dynamic partnership brings new understandings on partnership types, partnership and collaboration relationship, as well as the effects of partnership quality on corporate performance. CRV also ensure that *right group*, *right integration* and *right value* will be attained. However, there is still lack of support to attain the *right decision*. We believe there should be an environment, with sufficient information and knowledge support, facilitating practitioners to make the *right decision*.

5. Dynamic Partnership Realization

To make the right decision in catering a fast-changing market, practitioners have to be equipped with the most updated, accurate and diversified logistics information and knowledge to solve any kind of problems. The concept of dynamic partnership is clear, yet service providers lack the information, know-how and experience to practice online.

First, they need to know where to find, verify and select the potential partners. In which, they have to define and evaluate the three core factors. As the activities are performed by different parties (mostly partnering for the first time), they need ways to ensure all parties will follow the conformity, transparency and punctuality during the execution. Lastly, different parties also mean differences in culture, practices, planning methods, evaluation standard and service standard. Can the current information and knowledge technologies support resolving all these problems?

5.1 Information Limitations

Today, the technology on information platform is established: all players can easily get the information, such as shipment requirement, airline schedule, shippers and agents contacts. With the online tools supporting interactions [34][35][36], they can now establish basic communication easily. This allows them to locate and interact with the potential partners across the regions and globally. Also, different information systems can be integrated on the information platform without much effort. This helps the shipment monitoring and controlling.

However, there are still limitations which decrease agents' incentives in forming the dynamic partnership. For the core factors: the information platform does not provide guidance on verifying and selecting partners. The alignment of decisions is a major problem − participants need to negotiate extensively for the agreement on three factors. There is no tool to facilitate them making the appropriate decision collaboratively or timely. For the logistics process: there is also no support on the service and governance areas. No agent has the confidence that the dynamic partnership will be assured to carry out as expected.

5.2 Important Role of Knowledge

Adequate guidance should be provided on various areas: such as checking the creditability of an agent, selecting the suitable partners, designing the plan together, handling uncertainties and unknowns. It is unlikely that the practitioners own all the required knowledge. Unfortunately, neither the nature of current knowledge [37][38] nor the knowledge management technologies [39][40] can be used for enabling and evaluating dynamic partnership. They only support traditional forwarder's planning and operations by providing passive and non-interactive knowledge via knowledge retrieval and dissemination. Research on facilitating users create and apply knowledge area limited, which still highly rely on the intelligence and experience of the users. Issues on combining individual KM, facilitating partner formation, overcoming organization and people barriers [41], governing conflicts, protecting confidentiality were not addressed.

We have to introduce new knowledge and new management functions. New knowledge types are required to ensure the three core factors will be attained, and guarantee *right decisions* will be resulted. It is an on-demand formed knowledge created from shipment and logistics industry information, individual and partner requirements, which are different from the four existing knowledge types [37]. New knowledge functions should be developed for creating and applying new knowledge according to the needs of the logistics community. Further studies are required on this realm.

5.3 Attaining Dynamic Partnership on e-Platform

To attain the dynamic partnership in an e-platform environment, support for the definition, data collection and evaluation of the three core factors must be provided. As such, to support all the operations of the logistics community, the platform is also expected to operate flawlessly. To implement all these functions, the e-platform needs to equip with new knowledge types and management functions to support large number of inter-organizational partners to form partnership, plan and work together online. Here, we propose four new knowledge types: 1) objectifying, enables the establishment of the evaluation scheme; 2) integrative, facilitates the alignment of different agents' practices; 3) justifying, helps ensuring each partner's benefits and requirements; and 4) adaptive, analyzes and translates every partner's preferences onto the same basis, so as to facilitate the collaborative planning. New knowledge management functions are also needed. Thus, the three core factors will be attained, and guarantee *right decisions* will be resulted (Figure 3).

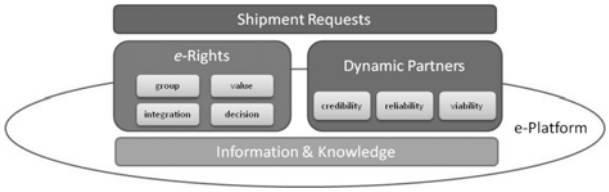

Figure 3. Dynamic Partnership on e-Platform

6. Conclusion

The logistics industry must move into the integrative era no later. Shipper's standards on logistics service quality could and should continue to increase. The online logistics community espouses competitions for every shipment. Conventional partnerships could only afford logistics service providers to service hardened online shipment requests likely to be out-competed by dynamic partners. Understandably, for providers to continue to survive they are to adopt dynamic partnership, effectively transforming to conduct business process online closely.

In this study, we have discussed the difficulties and challenges of adopting online collaborative partnership in the logistics community. The unification of partnership and collaboration is proposed which clearly describes the partner affinity, level of integrations, the requirements on direction flow and the complexity of information and knowledge. Practitioners are now equipped with a well-structured and comprehensive understanding on partnership and collaboration. The dynamic partnership concept provides the groundwork to sustain common offline partnering practices online and more. The three core factors assure a clear one-step dynamic partnership is achievable with a measurable success. Such dynamic partnership articulation provides also a basis for online collaboration design.

Realization of dynamic partnership on the community platform requires further research on design of the virtual environment in where dynamic partnerships flourish, and the necessary integrative technology to enable partnership formation and collaboration. Study is next needed on how to apply various functions to support the three core factors of dynamic partners. There are other issues to address that include e-service infrastructure and platform governance.

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Appendix

Table 1. Partnership Spectrum

	General Member	Subcontract/ Outsourcing	Alliance	Coalition	Joint Venture	Value-chain Vertical Integration	Dynamic Partnership
Duration	Short-term	Short-term	Medium-term	Short (Med) – term	Long-term	Long-term	Short-term
Equity ownership	No	No	No/Yes Joint-Ownership	No	Yes Linked Equity	Yes	No/Yes
Sharing/ Disclosure	Low Op. data	Low Op. data	Medium Op. data & Stra. info.	Medium Op. data & Stra. info.	High Op. data & Stra. info.	High Op. data & Stra. info.	High Op. data & Stra. info.
Decision Alignment	Similar interest	Cost / Time	Shared goal	Narrow aim	Same goal	One goal	Shared goal with local maxima
Governance	No	Contractual	Agreement on specific activity Pooling of resources	Limited coordination	Highly controlled	Work together Dominated control	Closely work together (No pre-defined dominated control)

Op. data: Operational data, Stra. info.: Strategic information